

# EXECUTIVE SUMMARY

This thesis report presents and investigates three structural redesign concepts for the Orchard Plaza office building. First, the initial gravity structure of composite beams and girders satisfactorily supports the prescribed design loads, but prohibits integration between the floor structure and HVAC systems. Cross sections of each system will be taken to compare the integration of existing HVAC ducts.

Second, the existing eccentric framing system performs nearly like a moment frame, but requires eleven bays of frames in order to control the building's drift limitations. A concentrically braced frame system will then be modeled and compared conceptually to a model of the existing lateral system. Since the façade's architecture drove the decision to use the original eccentric frames, architectural implications of using concentric frames will be analyzed and potential solutions will be presented.

Third, two auxiliary subjects will be explored regarding Orchard Plaza. The building will be modeled and tested under summer and winter daylighting conditions, as the current building provides little acknowledgement to solar concerns. Once the buildings shadow patterns are found, solutions to the various solar scenarios will be investigated and elaborated upon. A green roof will also be considered for the western half of Orchard Plaza's roof. Implications regarding system type, loading considerations, cost and maintenance will be presented along with the benefits of implementing a green roof system.